Methods: Forty-seven chronic stroke patients, and 26 healthy individuals participated in the study. We used peripheral quantitative computed tomography (pQCT) to evaluate the BMD and geometry of the distal radius epiphysis on both sides. Compressive bone strength index (cBSI) was computed based on the densitometric and geometric data derived from pQCT. Each subject was also evaluated for grip strength, spasticity, motor function, and sensation of the upper extremity. Indicators of cardiovascular health including the stroke volume, cardiac output, large and small artery elasticity indices (C1 and C2) were measured using impedance cardiography and pulse wave analysis.
Results: The side-to-side differences in total BMD, trabecular BMD, and cBSI were significant in the stroke group only (by 7-16%, $p<0.001$). Multiple regression analysis showed that grip strength ($p<0.001$) and C2 ($p<0.01$) were significant predictors of the cBSI of the hemiparetic distal radius.
Conclusion: The hemiparetic distal radius has compromised bone strength index, which is related to poorer cardiovascular health and muscle strength. Whether cardiovascular training and upper limb muscle strengthening can improve bone strength of the radius in stroke survivors awaits further research.

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Effects of Cadence, Load and Stair Dimensions on Measures of Energy Expenditure During Stair Use Among University Students

M. J. N. Peralta [a], **R. T. Q. Quintos** [b]
[a]University of Santo Tomas, Philippines
[b]University of the Philippines-Manila, Philippines

Background and purpose: Several studies have been done investigating stair climbing as a form of physical activity to improve health. This study aims to determine the interaction effects of stair dimensions, cadence and load on heart rate, oxygen consumption, and energy expenditure during stair ascent and decent.
Methods: This study is a repeated measures, experimental design. Students, 18-25 years old, in a selected University, were recruited for the study. Outcome measures used were heart rate (measured by a Polar Heart Rate Monitor), oxygen consumption and energy expenditure (both measured by the Cosmed K4B2 system Metabolic Cart). The protocol involved having the participants ascend and descend 2 types of stairwells with different combinations of load (with and without) and cadence (normal and fast), for a total of eight experimental conditions, sequence of which were determined randomly. Pairwise comparisons to represent relevant combinations of conditions were done statistically.
Results: Ascending and descending stairs using fast cadence while carrying a load equivalent to 10% of body weight, resulted to higher HR, oxygen consumption and energy expenditure compared to stair use with normal cadence without load, regardless of stair dimensions.
Conclusion: Stair ascent and descent performed with fast cadence while carrying load resulted to statistically significant increase in heart rate, regardless of stair dimensions. Clinically, the increase in oxygen consumption and energy expenditure found in these conditions potentially provides the benefits of aerobic exercise for health, when done in bouts throughout the day.

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The Effects of Speed-Dependent Treadmill Training on Gait and Balance Performance in Patients with Sub-Acute Stroke

W. K. Lau [a], **M. K. Y. Mak** [b]
[a]Physiotherapy Department, Tung Wah Eastern Hospital, HKSAR
[b]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, HKSAR

Background and purpose: Stroke is one of the major causes of mortality and morbidity in the elderly. Treadmill training has been used to improve balance, and walking performance in patients with stroke. Speed-dependent treadmill (SDT) is a new regime of training which enables patients to be trained to walk on treadmill with an interval sprinting training mode by varying the belt speed. SDT was found to be effective to improve gait and functional performance in patients with chronic stroke. However, the effect of SDT in patients with sub-acute stroke is not known. This study aimed to compare the effects of SDT and steady-speed treadmill training (SST) on gait and balance performance in patients with sub-acute stroke.
Methods: Twenty-eight subjects with stroke at sub-acute stage were randomly assigned to SDT ($n=15$) and control group ($n=13$). Subjects in the SDT group underwent SDT training while those in the control group had SST. Prior to and after 10 sessions of training, gait parameters (gait speed, stride length and cadence) and balance performance measured by Berg Balance Scale (BBS) were assessed and analyzed.
Results: Results of 2-way repeated measure ANOVA showed a significant group x session interaction for gait speed ($p<0.05$). Within each subject group, there were improvements in gait speed , cadence , stride length , and BBS (all $p<0.001$) after the training program. In addition, SDT group showed significantly higher percentage increases in gait speed (by 78.9%, $p<0.05$) and stride length (by 26.0%, ($p<0.05$) than the control group.
Conclusion: Both SDT and SST were effective to improve gait and balance performance in patients with sub-acute stroke. However, SDT achieved more percentage gains in gait speed and stride length when compared with SST. Findings of this study showed that SDT was more efficacious than SST in improving gait speed and stride length in patients with sub-acute stroke.

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The Pattern of Physical Activity Participation and its Association with Body Weight and Self-Reported Musculoskeletal Symptoms in Hong Kong Primary 4 to Secondary 3 Students

D. P. Y. Lui, G. P. Y. Szeto, A. Y. M. Jones
Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, HKSAR

Background and purpose: Previous studies have reported that students nowadays have increasingly sedentary lifestyle associated with prolonged electronic game playing, computer use and television viewing. These sedentary activities may contribute to musculoskeletal discomforts in growing children and adolescents. This study aimed to examine the physical activity pattern of children aged 8-14 in Hong Kong, and to evaluate the association of their activity pattern with body weight and musculoskeletal symptoms.
Methods: A self-administered questionnaire was applied to primary four to secondary three school students ($n=955$) to examine their activity participation which consisted of electronic game playing, computer use, TV viewing, other sedentary activities, and sports and exercise. Participants were also asked to report musculoskeletal symptoms in various body regions in the past month.
Results: High intensity use (>2 hrs/day) of electronic game (30.6%), computer use (37.7%) and TV viewing (38.1%) were reported, while only 17.7% had sufficient exercise intensity (>1 hr/day). Age was positively correlated ($p=0.000$) with electronic game playing ($r=0.405$) and computer use ($r=0.372$), but negatively correlated with active lifestyle ($r=-0.129$). Age-adjusted prevalence of overweight ($n=135$) and obese ($n=29$) individuals were also found. Highest prevalence of musculoskeletal discomforts was reported in the upper limb (46.6%) which was significantly correlated with electronic game playing ($r=0.113$) and computer use ($r=0.125$).
Conclusion: The results showed that students have a tendency to adopt inactive lifestyle with daily computer and electronic game use, and this is more evident in older adolescents. This may contribute to increased risk of developing overweight and musculoskeletal symptoms.

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Correlates of Exercise Recall and Performance with Exercise Compliance Among Well-Elderly Aged 65—75 Years Old

C. R. Peralta, K. L. Adivino, M. A. B. Calimag, K. Lindog, J. M. T. Manalili, T. M. T. Tan
University of Santo Tomas, Philippines

Background and purpose: Problems with exercise compliance have been found to increase in the elderly. This study aims to: (1) determine the relationships between exercise compliance, exercise recall and exercise